

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

AMENDMENTS TO THE CLAIMS

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A flow testing system designed for connection with a catalytic converter for facilitating the continuous flow testing of a plurality of catalytic converters fluid flow systems and components, said flow testing system comprising:

a flow amplifier subsystem configured for coupling to an air intake and for providing a controlled air flow;

a venturi subsystem configured for facilitating determination of said controlled air flow through providing of a pressure difference within;

a piping subsystem configured for coupling said flow amplifier subsystem to said venturi subsystem to receive said controlled air flow; and

an output coupling subsystem configured to couple said venturi subsystem to a catalytic converter a fluid flow component to provide a forced air flow through the catalytic converter the fluid flow component; and

wherein said flow testing system determines flow within the catalytic converter fluid flow component at a single atmospheric condition to determine if any blockage exists within the catalytic converter fluid flow component.

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

2. (Previously Presented) The flow testing system according to claim 1, wherein said flow amplifier subsystem is coupled to the air intake through a filter valve to enhance laminar flow.

3. (Original) The flow testing system according to claim 2, wherein said filter valve is configured to provide a seal for said flow amplifier subsystem during self-testing of said flow testing system.

4. (Previously Presented) The flow testing system according to claim 1, wherein said flow amplifier subsystem is configured to receive air from an air intake source of between approximately 80-100 PSI and a flow level between approximately 5-100 SCFM and convert air from the air intake source to a controlled air flow of between approximately 1-3 PSI and a flow level between approximately 75-1000 SCFM.

5. (Previously Cancelled)

6. (Previously Presented) The flow testing system according to claim 4, wherein said flow amplifier subsystem comprises:

a flow amplifier configured for coupling to an air intake and for providing a controlled air flow;

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

a seal test device configured to operate at a pressure between approximately 1-3 PSI and coupled to said flow amplifier and configured for providing a compliance seal to said flow amplifier to facilitate self-testing of said flow testing system;

a proportional regulator configured to regulate operation of said seal test device;
and

a check valve coupled between said seal test device and said proportional regulator to prevent air from flowing from said seal test device back to said proportional regulator.

7. (Original) The flow testing system according to claim 1, wherein said piping subsystem comprises a passageway and an output connection configured for providing measurements of one of temperature and barometric pressure to facilitate mass-flow calculations.

8. (Original) The flow testing system according to claim 7, wherein said piping subsystem further comprises a resistance temperature detector for providing temperature compensation during determination of said mass-flow calculations.

9. (Original) The flow testing system according to claim 1, wherein said venturi subsystem comprises:

a venturi component configured to facilitate measurement of said pressure difference, said venturi component having an entry output port and an exit output port; and

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

a pressure difference flow device coupled to said entry output port and an exit output port to measure said pressure difference to facilitate flow calculations.

10. (Original) The flow testing system according to claim 9, wherein said venturi and said pressure difference flow device are configured in a controlled feedback loop with said flow amplifier subsystem to facilitate said controlled air flow.

11. (Original) The flow testing system according to claim 9, wherein said pressure difference flow device is configured to receive a compensation signal to compensate for one of temperature and barometric pressure when determining said pressure difference to facilitate mass-flow calculations.

12. (Original) The flow testing system according to claim 9, wherein said pressure difference flow device comprises an output signal indicative of said pressure difference to facilitate flow calculations.

13. (Original) The flow testing system according to claim 1, wherein said venturi subsystem comprises one of a venturi, restrictor plate, orifice plate and a sonic nozzle.

14. (Currently Amended) The flow testing system according to claim 1, wherein said output coupling subsystem comprises a coupling component for coupling to the catalytic converter fluid flow component.

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

15. (Currently Amended) The flow testing system according to claim 14, wherein said coupling component comprises a seal nest having a plurality of adapter plates and a plurality of sealing rings configured for providing a seal around the catalytic converter fluid-flow component and to grip the catalytic converter fluid-flow component.

16. (Currently Amended) The flow testing system according to claim 1, wherein said output coupling subsystem system is configured for facilitating measurements of pressure differences between an entry side and an exit side of the catalytic converter fluid-flow component.

17. (Currently Amended) The flow testing system according to claim 1, wherein said flow testing system further comprises an automated positioning system configured for coupling said output coupling subsystem to the catalytic converter fluid-flow component, said automated positioning system comprising a gripper device for gripping the catalytic converter fluid-flow component, and a robot device for moving the catalytic converter fluid-flow component.

18. (Original) The flow testing system according to claim 1, wherein said output coupling subsystem comprises an end cap configuration for facilitating self-testing of said flow testing system.

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

19. (Original) The flow testing system according to claim 1, wherein said output coupling subsystem comprises an output device having an output port, and a pressure difference flow device having a first input port coupled to said output port of said output device for measurement of pressure within said output device, said pressure difference flow device having a second input port configured to measure ambient pressure.

20. (Currently Amended) The flow testing system according to claim 19, wherein said pressure difference flow device configured to measure differences in pressure of between said first input port and said second input port to facilitate mass-flow calculations for flow through the catalytic converter fluid component.

21. (Original) The flow testing system according to claim 20, wherein said flow testing system further comprises a control system configured for control of said flow testing system, said control system is coupled to said flow amplifier subsystem, said venturi subsystem and said output coupling subsystem to control operation of said flow testing system.

22. (Currently Amended) A method configured for providing continuous flow testing of catalytic converters fluid-flow systems and components, said method comprising the steps of: establishing a controlled air flow in a flow amplifier through a venturi configured in a closed-loop feedback system;

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

measuring flow within a catalytic converter fluid flow component at a single atmospheric condition by coupling with an output coupling subsystem configured for coupling to the catalytic converter; and

determining at said single atmospheric condition if a blockage exists in the catalytic converter said fluid flow component.

23. (Currently Amended) The method according to claim 22, wherein said step of establishing a controlled air flow occurs after connecting the catalytic converter said fluid flow component to an said output coupling subsystem.

24. (Currently Amended) The method according to claim 22, wherein said step of establishing a controlled air flow occurs before connecting the catalytic converter said fluid flow component to an said output coupling subsystem.

25. (Previously Presented) The method according to claim 22, wherein said step of establishing a controlled air flow in a flow amplifier comprises receiving air from an air intake source of between approximately 80-100 PSI and a flow level between approximately 5-100 SCFM and converting air from the air intake source to a controlled air flow of between approximately 1-3 PSI and a flow level between approximately 75-1000 SCFM.

26. (Previously Cancelled)

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

27. (Original) The method according to claim 22, wherein said step of establishing a controlled air flow comprises measuring differences in pressure within an entry port and an exit port of said venturi and calculating flow within said flow amplifier.

28. (Original) The method according to claim 27, wherein said step of measuring differences in said pressure comprises measuring said pressure with a pressure difference flow device coupled to said entry port and said exit port of said venturi.

29. (Original) The method according to claim 22, wherein said step of measuring differences in said pressure comprises compensating for one of a temperature and a barometric pressure to facilitate mass-flow calculations.

30. (Currently Amended) The method according to claim 22, wherein said step of measuring flow within the catalytic converter ~~said fluid component~~ comprises measuring differences in pressure within an entry side and an exit side of the catalytic converter ~~said fluid component~~ and calculating flow within the catalytic converter ~~said fluid component~~.

31. (Currently Amended) A flow testing system for facilitating the continuous flow testing of catalytic converters ~~fluid flow components~~, said flow testing system comprising:
a flow amplifier subsystem configured for coupling to an air intake and for providing a controlled air flow, said flow amplifier subsystem comprising a seal test device configured to operate at a pressure between approximately 1-3 PSI and coupled to a flow amplifier and

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

configured for providing a compliance seal to said flow amplifier to facilitate self-testing, a proportional regulator configured to regulate operation of said seal test device, and a check valve coupled between said seal test device and said proportional regulator to prevent air from flowing from said seal test device back to said proportional regulator;

a venturi subsystem coupled to said flow amplifier subsystem and configured for facilitating determination of said controlled air flow through providing of a pressure difference within;

an output coupling subsystem configured for connection to a catalytic converter to engage said venturi subsystem to the catalytic converter ~~a fluid flow component~~ to provide a forced air flow through the catalytic converter ~~fluid flow component~~; and

wherein said flow testing system determines at a single atmospheric condition if any blockage exists within the catalytic converter ~~fluid flow component~~.

32. (New) A flow testing system for facilitating the continuous flow testing of a plurality of catalytic converters to determine if any blockage exists within any of the plurality of catalytic converters, said flow testing system comprising:

a flow amplifier subsystem configured for coupling to an air intake and for providing a controlled air flow;

a venturi subsystem configured for facilitating determination of said controlled air flow through providing of a pressure difference within, said venturi subsystem configured for coupling to said flow amplifier subsystem to receive said controlled air flow; and

an output coupling subsystem configured for connection to a catalytic converter to provide a forced air flow through the catalytic converter.

Appl. No. 10/600,720
Amendment dated April 4, 2005
Reply to Final Office Action dated 10/05/2004

33. (New) The flow testing system according to claim 32, wherein said venturi subsystem comprises:

a venturi component configured to facilitate measurement of said pressure difference, said venturi component having an entry output port and an exit output port; and

a pressure difference flow device coupled to said entry output port and an exit output port to measure said pressure difference to facilitate flow calculations; and

wherein said venturi and said pressure difference flow device are configured in a controlled feedback loop with said flow amplifier subsystem to facilitate said controlled air flow.

34. (New) A method configured for providing continuous flow testing of catalytic converters, said method comprising the steps of:

establishing a controlled air flow in a flow amplifier through a venturi configured in a closed-loop feedback system;

providing an output coupling subsystem configured for connection to a catalytic converter;

measuring flow within the catalytic converter to determine whether a blockage exists in the catalytic converter.